Attorney Docket: 042390.P6242C

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Skinner

Application No.: not yet assigned

Filed: not yet assigned

For: <u>METHOD AND APPARATUS FOR REDUCING EMI EMISSIONS</u>

Examiner: not yet assigned

Art Unit: not yet assigned

<u>PRELIMINARY AMENDMENT</u>

Box Non-Fee Amendment
HONORABLE COMMISSIONER FOR PATENTS
Washington, D.C. 20231

Dear Sir:

The above-referenced patent application is a continuation patent application under 37 CFR 1.53(b). Applicant respectfully requests that the Examiner enter the following amendments and consider the following remarks. It is noted that a version of the claims and the specification with markings appears at the end of this amendment per 37 C.F.R §1.121.

<u>IN THE SPECIFICATION</u>

Please insert the following new paragraph in front of the patent application:

--- This is a Continuation Patent Application of U.S. Patent application serial No. 09/179,915, filed October 27th, 1998, titled, "Method and Apparatus for Reducing EMI Emissions," by Harry G. Skinner, assigned to the assignee of the present invention and herein incorporated by reference. ---

IN THE CLAIMS

Please amend the claims as follows:

1. (Amended) A circuit to encode binary digital signals so as to reduce EMI emissions during signal transmission across a bus or interconnect comprising:

circuitry to generate a pseudo-random pattern of binary digital signals; and

circuitry to apply logic operations to selected binary digital signals, the selected binary digital signals to be encoded prior to signal transmission across the bus or interconnect, with selected binary digital signals of the pseudo-random pattern in order to reduce the harmonic content of the selected binary digital signals to be encoded;

wherein the binary digital signals comprise regular binary digital signals.

Cancel claim 3.

4. (Amended) The circuit of claim 1, wherein the regular binary digital signals comprise video digital interface signals.

5. (Amended) The circuit of claim 1, wherein the regular binary digital signals comprise digital clock signals.

9. (Amended) A method of encoding binary digital signals so as to reduce EMI emissions during signal transmission across a bus or interconnect comprising:

generating a pseudo-random pattern of binary digital signals;

applying logic operations to selected binary digital signals, the selected binary digital signals to be encoded prior to signal transmission across the bus or interconnect, with selected binary

digital signals of the pseudo-random pattern in order to reduce the harmonic content of the selected binary digital signals to be encoded;

wherein the binary digital signals comprise regular binary digital signals.

Cancel claim 11.

12. (Amended) The method of claim 9, wherein the regular binary digital signals comprise video digital interface signals.

13. (Amended) The method of claim 9, wherein the regular binary digital signals comprise digital clock signals.

15. (Amended) A circuit to decode binary digital signals that have been encoded so as to reduce EMI emissions during signal transmission across a bus or interconnect comprising:

circuitry to apply logic operations to selected encoded binary digital signals to be decoded, the encoded binary digital signals being encoded to reduce the harmonic content of the pre-encoded binary digital signals, with selected binary digital signals of a pseudo-random pattern used to encode the encoded binary digital signals;

wherein the binary digital signals comprise regular binary digital signals.

24. (Amended) A method of decoding binary digital signals that have been encoded so as to reduce EMI emissions during signal transmission across a bus or interconnect comprising:

applying logic operations to selected encoded binary digital signals to be decoded, the encoded binary digital signals being encoded to reduce the harmonic content of the pre-encoded binary digital signals, with selected binary digital signals of a pseudo-random pattern used to encode the encoded binary digital signals;

wherein the binary digital signals comprise regular binary digital signals.

28. (Amended) A circuit to encode binary digital signals so as to reduce EMI emissions during signal transmission across a bus or interconnect comprising:

circuitry to apply at least one pseudo-random pattern of binary digital signals to encode selected binary digital signals so as to reduce the harmonic content of the selected binary digital signals;

wherein the binary digital signals comprise regular binary digital signals.

Cancel claim 29.

30. (Amended) The circuit of claim 28, wherein the regular binary digital signals comprise video digital interface signals.

31. (Amended) The circuit of claim 28, wherein the regular binary digital signals comprise digital clock signals.

34. A method of encoding binary digital signals so as to reduce EMI emissions during signal transmission across a bus or interconnect comprising:

applying at least one pseudo-random pattern of binary digital signals to encode selected binary digital signals so as to reduce the harmonic content of the selected binary digital signals;

wherein the binary digital signals comprise regular binary digital signals.

Cancel claim 35.

36. (Amended) The method of claim 34, wherein the regular binary digital signals comprise video digital interface signals.

37. (Amended) The method of claim 34, wherein the regular binary digital signals comprise digital clock signals.

REMARKS

The above-referenced patent application has been reviewed in light of the Final Office Action, dated December 12th, 2000, in which: Claims 4-5 are rejected under 35 U.S.C 112, second paragraph for indefiniteness; Claims 12-13, 30-31, and 36-37 are objected to due to informalities; Claims 1-2, 4-10, 12-16, 20-28, 30-34, and 36-37 are rejected under 35 U.S.C. 112, first paragraph; Claims 1-2, 4-10, 12-16, 20-28, 30-34, and 36-37 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Lee, (hereinafter "Lee", US Patent No. 6,026,124); and Claims 1-2, 4-10, 12-16, 20-28, 30-34, and 36-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee. Reconsideration of the above-referenced patent application in view of the foregoing changes and the following remarks is respectfully requested.

Claims 1-2, 4-10, 12-16, 20-28, 30-34, and 36-37 are now pending the above-referenced patent application. Claims 1, 4, 5, 12, 13, 15, 24, 28, 30, 31, 34, 36 and 37 have been amended, claims 3, 11, 29 and 35 have been cancelled, and no new claims have been added. It is noted that numbers 17-19 were inadvertently skipped when numbering the claims in the original application.

Claims 4 and 5 have been amended to clearly identify which claim they depend from. It is respectfully requested that the Examiner withdraw his rejection of these claims. The Examiner has objected to claims 12-13, 30-31, and 36-37 for informalities. These claims have been amended to remove the informalities. The above changes do not alter the scope of these claims in any way, in that they are directed to informalities and/or indefiniteness rejections. Likewise, no prosecution history estoppel is present.

The Examiner has introduced what he believes to be "secondary issues". While Applicant does not feel that it is necessary to address each of these allegations, the sum of the Examiner's arguments seem to be as follows: The Examiner believes that he is unable to impart a "degree" to the term regular, and is also prevented from imparting a particular "kind" to the term regular, as used in "regular binary digital signals". The Examiner appears to hold the position that this essentially makes the rejected claims unpatentable over Lee.

It is respectfully asserted that the Examiner's analysis regarding "degree" is not relevant to distinguish the rejected claims from Lee, as Lee does not relate at all to the term "regular", and so this entire line of analysis is unnecessary to defeat any rejections under 35 U.S.C 102 or 103 cited by the Examiner.

Additionally, the Examiner states that he is unable to impart a kind of regular under the doctrine of claim differentiation. Again, this analysis is unnecessary to defeat any prior art rejections over Lee, as Lee does not relate at all to the term "regular". Furthermore, the Examiner states, at page 10, "depending claims broaden the "term" regular by specifying what kind of regular is NOT in the independent claims." (emphasis in original).This is not correct. While the dependent claims cover more subject matter than the dependent claims, the subject matter of the independent claims must include that of the dependent claims. Therefore, the entire premise of the Examiner's position regarding "kind" is not correct.

IT IS FINALLY NOTED THAT THE FAILURE TO RESPOND TO EACH AND EVERY ALLEGATION BY THE EXAMINER IS NOT A CONCESSION OR ADMISSION OF ANY OF THE EXAMINER'S STATEMENTS.

The Examiner has rejected Claims 1-2, 4-10, 12-16, and 20-28, 30-34, and 36-37 under 35 U.S.C. 112, first paragraph. The rejection of these claims by the Examiner is respectfully traversed.

It is well-established that a claimed invention need only be enabled insofar as to not necessitate undue experimentation. As stated in *In Re Wands, 858 F.2d 731, 737 (Fed. Cir.*

1988), "Enablement is not precluded by the necessity for some experimentation...However, experimentation needed to practice the invention must not be undue experimentation. The key word is 'undue' not 'experimentation.'" (quoting from *In re Angstadt, 537 F.2d 498, 502-504 (Fed. Cir. 1988)*. In the *Wands* case, the issue was whether or not monoclonal antibodies needed to make the invention at issue were adequately enabled. The court went on to find that the process of making these antibodies was well known within the monoclonal antibody art, and were therefore adequately enabled. Additionally, it is well-established that a patent need not teach, and preferably omits, what is well known in the art. *In Re Buchner, 18 USPQ2d 1331 (Fed. Cir. 1991).*

It is respectfully asserted that the present application adequately enables one skilled in the relevant art to make and/or use the invention as recited in the rejected claims. One skilled in the art of EMI and/or production of pseudo-random binary digital signals would be adequately enabled to make and use the claimed invention. For example, without intending to limit the claims, circuitry to encode binary digital signals so as to reduce EMI emissions is capable of being built by one of ordinary skill, by using what is already well known in the relevant art, along with the specification and figures of the present application.

The Examiner has repeated his arguments presented in the last office action, and requests a clarification as to whether or not the Applicant would consider "reducing the harmonic content" as implicit to the "pseudo-random binary sequence" referenced by the Lee patent. As stated in the previous response to the Examiner's Office Action, the Applicant would not consider reducing harmonic content to be an implicit effect of utilization of a pseudo-random binary sequence, as it depends, at least in part, upon the context of the pseudo-random binary sequence, and, at least in part, upon how it is applied to a particular device.

The Applicant believes that reduction in harmonic content would not necessarily follow from use of a pseudo-random binary sequence. As just an example, if an incoming binary digital signal were random in nature and thus DC unbalanced, and a technique described by Lee were applied to the signal, the resultant signal would be a DC balanced signal, and thus be more regular that the

incoming signal. However, this signal would have an increased harmonic content as compared to the incoming signal. This is one example where use of a pseudo random binary digital signal results in an increase in harmonic content, and, therefore, the argument that there is an implicit reduction in harmonic content fails based on this example.

The Examiner also again asked how the Applicant might consider the binary digital signals in the Lee patent irregular as opposed to the Applicant's definition of regular, and has also asked for clarification for the phrase "regular digital signal". It is the Applicant's position that a regular digital signal is what one of ordinary skill in the art would consider to be regular in light of the following language from lines 8-11 of page 5 of the specification:

> In this context, the term "regular" refers to bit patterns and signal patterns that are repetitive. Again, as previously described, an example of this in digital electronic circuitry includes clocks or clock pulses, ...

As stated in *Johnson Worldwide Associates v. Zebco Corp., 175 F.3d 985, 990 (Fed. Cir. 1999)* "Our case law demonstrates two situations where a sufficient reason exists to require the entry of a definition of a claim term other than its ordinary or customary meaning. The first arises if the patentee has chosen to be his or her own lexicographer by clearly setting forth an explicit definition for a claim term." Furthermore, as stated in *Loctite Corp. v. Ultraseal Ltd., 228 USPQ 90 (Fed. Cir. 1985)*, "Claims should be construed as they would be by those skilled in the art." It is respectfully asserted that the Applicant has clearly set forth an explicit definition for the term "regular", and one of ordinary skill would understand the scope of what is being claimed based upon that definition.

The Examiner has asked to be pointed to the enabling subject matter for the term "regular digital signal". Applicant has referred specifically to FIG. 1, circuitry 110, and also the corresponding description of FIG.1, found primarily in the last paragraph of page 6 of the detailed description. Nonetheless, it is not the law that the claim terms are to be separately enabled, but rather that the claimed invention as a whole must be adequately enabled. The Examiner, therefore, should not request enabling material for "regular digital signals" per se, but rather, the claimed

invention as a whole. As stated previously, Applicant believes that the claimed invention has been adequately enabled. It may have been Examiner's intent to ask where in the specification the term "regular digital signal" has been adequately described, as per 35 U.S.C 112, second paragraph. Again, however, Applicant believes that the term has been adequately described as well, as stated previously.

In summary, it is respectfully asserted that there is adequate disclosure within the specification to enable one skilled in the art to make and use the claimed invention. From the portions of the specification indicated by the Applicant above, for example, one of ordinary skill in the art would have no difficulty understanding the meaning of "regular binary digital signal", and would have no difficulty practicing the claimed invention. Withdrawal of the Examiner's rejection is respectfully requested.

The Examiner has rejected Claims 1-2, 4-10, 12-16, and 20-28, 30-34, and 36-37 under 35 U.S.C. 102(e). The rejection of these claims by the Examiner is respectfully traversed.

It is well-established that in order to establish a *prima facie* case of anticipation under section 102 of the patent statute, the Examiner must a provide prior art document that meets each and every element and limitation of the rejected claim. Therefore, even if a single element or limitation is not met by the asserted document, then the Examiner has not succeeded in establishing a *prima facie* case.

Applicants begin with claim 1. Claim 1 recites:

"A circuit to encode binary digital signals so as to reduce EMI emissions during signal transmission across a bus or interconnect comprising:

circuitry to generate a pseudo-random pattern of binary digital signals; and

circuitry to apply logic operations to selected binary digital signals, the selected binary digital signals to be encoded prior to signal transmission across the bus or interconnect, with selected binary digital signals of the pseudo-random pattern in order to reduce the harmonic content of the selected binary digital signals to be encoded;

wherein the binary digital signals comprise regular binary digital signals."

According to the Examiner, Lee clearly anticipates the rejected claims. The Examiner specifically refers to Figures 7B1-7B2, 10-14, and the corresponding written description of Lee. In addition the Examiner refers to col. 1, lines 50-55, and col. 5, lines 52-59. The Examiner goes on to state, "The [E]xaminer firmly believes that '124's pseudo random binary sequence does in fact reduce '124 harmonic content and thus EMI. This fact appears to have been specifically recognized at '124's col 1 line 51." Additionally, the Examiner states, "The [E]xaminer firmly believes that an expert would recognize that the '124 teaching results in reduced harmonic content as related to EMI."

It is respectfully requested that the Examiner provide citations to the Lee patent that teach a method for reducing harmonic content, and how the Lee patent teaches a method for reducing EMI. In addition, just for the sake of legal argument, and not conceding any of the statements made by the Examiner, that the Lee patent did teach reduction in EMI, Lee would still not contain all of the limitations of the rejected claims. Additionally, the Lee patent would not necessarily produce both a DC balanced and reduced EMI signal. It is possible to produce a DC balanced signal that has relatively high EMI and greater EMI than the incoming signal. As just an example, if there were 8 parallel signals being input into the Lee device, the output signal could be a balanced '10101010'. This signal would have a relatively high EMI value but would be DC balanced. It is the Applicant's position that there is no inherent reduction in EMI when producing a signal that is DC balanced, as is implicitly and explicitly asserted by the Examiner. It is respectfully asserted that at least one element of claim 1 is not met by the Lee patent, and, therefore, the Lee patent fails to anticipate the rejected claims. It is respectfully requested that the Examiner withdraw his objection to claim 1.

Claims 2, and 4-8, depend from and include all the limitations of claim 1, as amended. These claims patentably distinguish from the cited patent for at least the same reasons as claim 1. Therefore, it is respectfully requested that this rejection of these claims be withdrawn.

The Examiner has also rejected claims 9-10, and 12-14 under 102(e) on Lee. It is respectfully asserted that claim 9 patentably distinguishes from the cited patent for similar reasons described above regarding claim 1. As just an example, the Lee patent fails to disclose a method of encoding binary digital signals so as to reduce EMI. Therefore, it is respectfully requested that this rejection of these claims be withdrawn.

Claims 10, and 12-14, depend from and include all the limitations of claim 9. Therefore, these claims patentably distinguish from the cited patent for at least the same reasons as claim 9. Therefore, it is respectfully requested that this rejection of these claims be withdrawn.

The Examiner has rejected claims 15-16, and 20-23 under 102(e) in view of Lee. It is respectfully asserted that claim 15 patentably distinguishes from the cited patent for similar reasons described above regarding claim 9. As just one example, the Lee patent fails to disclose a circuit that has the capability of decoding encoded binary digital signals that have been encoded so as to reduce EMI. Therefore, it is respectfully requested that this rejection of these claims be withdrawn.

Claims 16, and 20-23, depend from and include all the limitations of claim 15. Therefore, these claims patentably distinguish from the cited patent for at least the same reasons as claim 15. Therefore, it is respectfully requested that this rejection of these claims be withdrawn.

The Examiner has rejected claims 24-27 under 102(e) in view of Lee. It is respectfully asserted that claim 24 patentably distinguishes from the cited patent for similar reasons described above regarding claim 15. As just an example, Lee fails to disclose a method for decoding binary digital signals that have been encoded so as to reduce EMI. Therefore, it is respectfully requested that this rejection of claim 24 be withdrawn.

Claims 25-27 depend from and include all the limitations of claim 24. Therefore, these claims patentably distinguish from the cited patent for at least the same reasons as claim 24. Therefore, it is respectfully requested that this rejection of these claims be withdrawn.

The Examiner has rejected claims 28, and 30-33 under 102(e) in view of Lee. It is respectfully asserted that claim 28 patentably distinguishes from the cited patent for similar reasons described above regarding claim 24. As just an example, the Lee patent fails to disclose a circuit that has the capability to encode binary digital signals so as to reduce EMI. Therefore, it is respectfully requested that this rejection of claim 28 be withdrawn.

Claims 30-33 depend from and include all the limitations of claim 28. Therefore, these claims patentably distinguish from the cited patent for at least the same reasons as claim 28. Therefore, it is respectfully requested that this rejection of these claims be withdrawn.

The Examiner has rejected claims 34, and 36-37 under 102(e) in view of Lee. It is respectfully asserted that claim 34 patentably distinguishes from the cited patent for similar reasons described above regarding claim 24. As just an example, Lee fails to disclose a method for decoding binary digital signals that have been encoded so as to reduce EMI. Therefore, it is respectfully requested that this rejection of claim 34 be withdrawn.

Claims 36-37 depend from and include all the limitations of claim 34. Therefore, these claims patentably distinguish from the cited patent for at least the same reasons as claim 34. Therefore, it is respectfully requested that this rejection of these claims be withdrawn.

The Examiner has rejected claims 1-2, 4-10, 12-16, and 20-28, 30-34, and 36-37 under 35 U.S.C. 103(a) as being unpatentable over Lee. The rejection of these claims by the Examiner is respectfully traversed.

It is respectfully asserted that there are claimed features lacking in the Lee patent. For example, the Lee patent does not disclose circuitry that produces an encoded signal that has a reduced EMI, but rather discloses a method for producing a signal that is DC balanced. As stated previously, a DC balanced signal and a signal with reduced EMI are not interchangeable. Assuming only for the sake of legal argument, and, therefore, not conceding that Lee could be modified, it would still require substantial and non-obvious modifications to make it operate in the manner claimed by Applicants. Additionally, Lee fails to recognize any of the benefits of reduced EMI, and

is designed for producing signals that are DC balanced. Conceptually, DC balancing and reducing EMI are two entirely different purposes and are not interchangeable. Therefore, the rejected claims are not obvious in light of Lee. It is, therefore, respectfully requested that the Examiner withdraw his 103(a) rejection of these claims.

The Applicant reiterates arguments already stated based on the 102(e) rejection. As stated previously, the claims describe, among other aspects, a technique to make a regular binary signal non-regular. The method in Lee is described substantially in lines 1-17 of column 3. This method refers to selective complementation and cumulative disparity, and goes on to describe in detail a method that does not render the approach described and claimed in the present application unpatentable.

CONCLUSION

In view of the foregoing, it is respectfully asserted that all claims pending in this application, as amended, are in condition for allowance. If the Examiner has any questions, or would like any clarification for any of the questions that the Applicant has answered per his request, he is invited to contact the undersigned at (503) 264-9427. Reconsideration of this patent application and early allowance of all the claims is respectfully requested.

Respectfully submitted,

Howard A. Skaist
Senior Intellectual Property Attorney
Reg. No. 36,008

Dated: 7/23/01

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Cinger C. Tan 7.25.01
Signature Date

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please insert the following paragraph at page 2, line 4:

This is a Continuation Patent Application of U.S. Patent application serial No. 09/179,915, filed October 27th, 1998, titled, "Method and Apparatus for Reducing EMI Emissions," by Harry G. Skinner, assigned to the assignee of the present invention and herein incorporated by reference.

IN THE CLAIMS:

The following claims have been amended as follows:

1. (Amended) A circuit to encode binary digital signals so as to reduce EMI emissions during signal transmission across a bus or interconnect comprising:

circuitry to generate a pseudo-random pattern of binary digital signals; and

circuitry to apply logic operations to selected binary digital signals, the selected binary digital signals to be encoded prior to signal transmission across the bus or interconnect, with selected binary digital signals of the pseudo-random pattern in order to reduce the harmonic content of the selected binary digital signals to be encoded;

wherein the binary digital signals comprise regular binary digital signals.

4. (Amended) The circuit of claim 1 ~~3~~, wherein the regular binary digital signals comprise video digital interface signals.

5. (Amended) The circuit of claim 1 ~~3~~, wherein the regular binary digital signals comprise digital clock signals.

9. (Amended) A method of encoding binary digital signals so as to reduce EMI emissions during signal transmission across a bus or interconnect comprising:

generating a pseudo-random pattern of binary digital signals;

applying logic operations to selected binary digital signals, the selected binary digital signals to be encoded prior to signal transmission across the bus or interconnect, with selected binary digital signals of the pseudo-random pattern in order to reduce the harmonic content of the selected binary digital signals to be encoded;

wherein the binary digital signals comprise regular binary digital signals.

12. (Amended) The method of claim 9 ~~11~~, wherein the regular binary digital signals comprise video digital interface signals.

13. (Amended) The method of claim 9 ~~11~~, wherein the regular binary digital signals comprise digital clock signals.

15. (Amended) A circuit to decode binary digital signals that have been encoded so as to reduce EMI emissions during signal transmission across a bus or interconnect comprising:

circuitry to apply logic operations to selected encoded binary digital signals to be decoded, the encoded binary digital signals being encoded to reduce the harmonic content of the pre-encoded binary digital signals, with selected binary digital signals of a pseudo-random pattern used to encode the encoded binary digital signals;

wherein the binary digital signals comprise regular binary digital signals.

24. (Amended) A method of decoding binary digital signals that have been encoded so as to reduce EMI emissions during signal transmission across a bus or interconnect comprising:

applying logic operations to selected encoded binary digital signals to be decoded, the encoded binary digital signals being encoded to reduce the harmonic content of the pre-encoded binary digital signals, with selected binary digital signals of a pseudo-random pattern used to encode the encoded binary digital signals;

wherein the binary digital signals comprise regular binary digital signals.

28. (Amended) A circuit to encode binary digital signals so as to reduce EMI emissions during signal transmission across a bus or interconnect comprising:

circuitry to apply at least one pseudo-random pattern of binary digital signals to encode selected binary digital signals so as to reduce the harmonic content of the selected binary digital signals;

wherein the binary digital signals comprise regular binary digital signals.

30. (Amended) The circuit of claim 28 ~~29~~, wherein the regular binary digital signals comprise video digital interface signals.

31. (Amended) The circuit of claim 28 ~~29~~, wherein the regular binary digital signals comprise digital clock signals.

34. A method of encoding binary digital signals so as to reduce EMI emissions during signal transmission across a bus or interconnect comprising:

applying at least one pseudo-random pattern of binary digital signals to encode selected binary digital signals so as to reduce the harmonic content of the selected binary digital signals;

wherein the binary digital signals comprise regular binary digital signals.

36. (Amended) The method of claim 34 ~~35~~, wherein the regular binary digital signals comprise video digital interface signals.

37. (Amended) The method of claim 34 ~~35~~, wherein the regular binary digital signals comprise digital clock signals.